

committee's surveyors. The collective capacity of new cold stores and extensions carried out under Lloyd's survey amounts to 7,500,000 cub. ft. The committee has also undertaken research work at its own expense, one of the subjects at present engaging the attention of the special sub-committee on research being the effect of a fluid cargo in the form of oil in bulk on the behaviour of a ship in a seaway, and the manner in which energy passes between the ship and the fluid in the holds. The report is voluminous, and it is only possible to touch upon a few of the leading items of interest.

THE new monthly *Conquest*, of which the first number has just been issued, will fill a want long felt by the British public for a magazine giving, in popular language, an account of the scientific and technical achievements of the day. Readers having a technical bent were obliged to glean what information they could from the technical journals proper, or, if they read French sufficiently well, to subscribe to a well-known French periodical which fulfils the same function. The first number contains well-written and illustrated articles on the running of the London tubes, the technique of film-making, the internal structure of metals (by Dr. Walter Rosenhain), and other interesting contributions.

The Cambridge University Press hopes to have vol. iii. of the "Cambridge British Flora" ready for publication before the end of the year. Other announcements of the same publishers are a new edition of Prof. A. H. Keane's "Man, Past and Present," completely revised and largely rewritten by Mrs. Quiggin, with the assistance of Dr. A. C. Haddon; "Pleasure—Unpleasure," an experimental investigation on the feeling-elements, Dr. A. Wohlgemuth; "Chemistry for Textile Students," Prof. B. North and N. Bland; "Machine Drawing for Electrical Engineers," E. Blythe; "Food Poisoning and Food Infections," Dr. W. G. Savage; "Practical Exercises on the Weather and Climate of the British Isles," W. F. Stacey; "The Physiology of Farm Animals, Part i. (General)," Dr. F. H. A. Marshall; "General Psychology," W. S. Hunter; "Practical Geometry," C. Godfrey and A. W. Siddons; and "The Elements of Analytical Conics," Dr. C. Davison. The Library Press, Ltd., has nearly ready for inclusion in its Manufacturing Problem Series "The Management Problem," E. T. Elbourne, and in preparation "The Reorganisation Problem," J. E. Powell, and "The Workers' Problem," W. Wilkinson. The S.P.C.K. will publish "Woodcraft Scouting in Town and Suburb," the Rev. W. Bren ("Silver Wolf").

A CATALOGUE (No. 78) interesting not only by reason of its contents, but also from the fact that many of the volumes offered for sale are from the libraries of the late Prof. T. McKenny Hughes and Mr. W. E. Balston, and that the geological portion of the library of Dr. Henry Woodward is included, has just been circulated by Messrs. Dulau and Co., Ltd., 34-36 Margaret Street, W.1. The 1018 works listed range over the subjects of zoology, botany and horticulture, geology and palæontology, astronomy, physics, etc., geography and travel. Many scarce books are on sale, but the majority of the volumes offered are obtainable for reasonable prices.

READERS of NATURE on the look-out for bargains in books for personal use or for presents would do well to see the Catalogue (No. 183) just issued by Messrs. W. Heffer and Sons, Ltd., Cambridge. All the works listed are new copies, and the reductions in price from those at which they were originally published are

in many cases remarkable. Most branches of literature are represented, and many well-known books of science of comparatively recent publication are included.

MR. F. EDWARDS, 83 High Street, Marylebone, W.1, has just published an illustrated Catalogue (No. 395) of valuable early English and foreign books. The sections most likely to appeal to readers of NATURE are those referring to works dealing with Africa, America, Medicine, Herbals, Husbandry, and Natural History.

THE Society of Glass Technology should have been included in the list of scientific societies founded in the last fifty years given in the jubilee issue of NATURE. The society was founded in November, 1916, and has 550 members. Its work has frequently received favourable notice in our columns.

OUR ASTRONOMICAL COLUMN.

LARGE FIREBALL.—On November 2, at 7.6 p.m., a fireball of considerable brilliancy was seen by Mr. C. P. Adamson, of Wimborne, Dorset. Its observed flight was from $40^{\circ}+7^{\circ}$ to $51^{\circ}+4^{\circ}$, and it had an extremely slow motion, its visible duration being carefully estimated as five seconds. The nucleus left a short train behind it.

The same object was observed by Dr. Cowper at Shanklin, Isle of Wight. The meteor was comparable with a football in regard to apparent size and shape. It fell in due east in a nearly vertical direction.

From these details it is not possible to deduce exact values for the height, etc., and further observations are required. Probably the radiant was at $312^{\circ}+14^{\circ}$; and the height, 56 to 29 miles; path, 39 miles; and velocity, 10 miles. The object was over France in the region 45 miles east of Boulogne.

COMETS.—Mr. Sassaki, of Kyoto, Japan, discovered a comet on October 25 in R.A. 20h. 17m. 20s., south declination $27^{\circ} 11'$, the G.M.T. being October 24d. 23h. It was reobserved on November 9 by M. Schaumasse at the Nice Observatory, and was then found to be identical with Finlay's periodic comet, for which the Nice Observatory had already published a search ephemeris. As the comet's period is close to $6\frac{1}{2}$ years, it is well placed every thirteen years, and usually escapes observation at the intervening return. On November 11 it approached the earth within some 15,000,000 miles, its apparent magnitude being 9.0. The following is an ephemeris for Greenwich midnight:—

		R.A.			N. Decl.	Log r	Log Δ
		h.	m.	s.			
Nov.	21 ...	0	35	0	5 15	0.0606	9.3149
	25 ...	1	4	20	9 24	0.0713	9.3657
	29 ...	1	28	4	12 38	0.0818	9.4166
Dec.	3 ...	1	48	4	15 7	0.0920	9.4658
	7 ...	2	6	12	17 1	0.1020	9.5140

The following is a continuation of the ephemeris of Schaumasse's periodic comet 1911 VII. for Greenwich midnight. The magnitude is about 12.5:—

		R.A.			N. Decl.	Log r	Log Δ
		h.	m.	s.			
Nov.	19 ...	13	15	41	2 32	0.1081	0.2671
	23 ...	13	28	47	1 28		
	27 ...	13	41	30	0 26	0.1198	0.2710
Dec.	1 ...	13	53	51	S. Decl.		
	5 ...	14	5	49	1 32	0.1329	0.2745

The above ephemerides do not claim great accuracy, and some sweeping may be necessary to find the comets.

Later.—The Finlay ephemeris needs corrections of $-24m$. R.A., -3° decl.

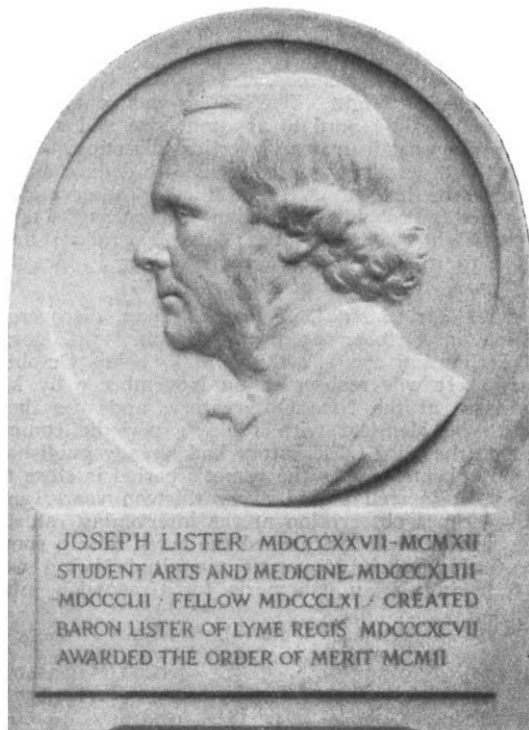
M. Ebell gives the following orbit of Kopff's comet 1919a, from observations 1919 July 31, August 20, September 16 (*Ast. Nach.*, 5016):—

$T = 1919 \text{ June } 28^{\text{h}} 21^{\text{m}} 0^{\text{s}}$ G.M.T.	$\phi = 30^\circ 56' 40''$
$\omega = 19^\circ 43' 51''$	$\mu = 538.904''$
$\Omega = 263^\circ 48' 51''$ 1919.0	$\log a = 0.545664$
$i = 8^\circ 41' 30''$	Period = 6.5841 years

The mean observed period between 1906 and 1919 is 6.5766 years.

UNVEILING OF LISTER MEMORIAL TABLETS.

BRIEF mention was made last week of the unveiling at University College, London, of two bas-relief tablets in memory of Lord Lister, one of the most distinguished *alumni* of the college. There were present the Duke of Bedford (president of the Lister Memorial Committee), the president of the Royal Society, the president of the Royal College of Surgeons, Sir William Lister, the Misses Lister, and Miss Godlee (relatives of the late Lord Lister), the



Lister Memorial Tablet at University College, London. A similar tablet has been secured for University College Hospital, where Lister was student and house surgeon in 1843-52.

Vice-Chancellor of the University, the Provost of University College and Lady Foster, Sir John Bradford, Sir George Thane, Sir Thomas Barlow, Sir John Tweedy, Sir Ernest Hatch, and many others. The proceedings were opened by the Duke of Bedford, who referred to Lister's connection with University College, and commented upon the great value of Lister's presence in the House of Lords. Before unveiling the tablet destined to be erected at University College Hospital, where Lister was once house surgeon, Sir George Makins outlined the main events of Lister's life, the success of which was due to his thorough training as a student. Sir

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Joseph Thomson unveiled the tablet for University College. He said that Lister, one of the glories of British science, began his connection with the Royal Society at the early age of thirty-three, when he was elected a fellow. During Lister's five years' tenure of the presidency of the society much excellent administrative work was carried out, and this epoch saw the inception of several famous biological investigations organised by the society. The Provost (Sir Gregory Foster) then invited Sir Edwin Cooper Perry (the Vice-Chancellor), Sir George Thane, Sir Ernest Hatch, and Mr. Raymond Johnson to accept the tablets on behalf of the bodies they represented. Sir George Thane, in reply, mentioned that University College had that day been presented with one of Lister's prizes received whilst a student, and he expressed the hope that owners of Lister mementoes might present them to the college. On behalf of the memorial committee Sir John Tweedy conveyed the thanks of the subscribers to the sculptor, Prof. Havard Thomas.

THE BRITISH ASSOCIATION AT BOURNEMOUTH.

SECTION I.

PHYSIOLOGY.

OPENING ADDRESS (ABSTRACTED) BY PROF. D. NOËL PATON, M.D., F.R.S., PRESIDENT OF THE SECTION.

IN the advance of every science certain difficulties and dangers which must be encountered tend to make the progress of knowledge somewhat devious, somewhat zigzag in character.

(1) The study of the metabolism of proteins in the animal body, especially when they are considered as a source of energy, illustrates this in a striking manner. Liebig's teaching insisted on their prime importance. The investigations of Voit and of Fick and Wislicenus—unsatisfactory as the latter were—caused a swing to the other extreme, to the view that carbohydrates, not proteins, are the main source of energy. The work of Pflüger and of his school brought about a temporary swing back to Liebig's teaching. Only when it became possible to study the respiratory exchanges along with the excretion of nitrogen was a true knowledge gained of the relative importance of proteins and of the other two proximate principles.

(2) As regards the use of proteins in the building and repair of the tissues, progress has been more direct, and has ultimately led to the recognition of the importance of the constituent amino-acids as the "building stones" of the proteins. In this connection the importance of the diamino-acids lysin, histidin, and arginin must be recognised. Their presence has been shown to be necessary for growth. The presence of guanidin in the arginin molecule requires more attention than it has yet received.

(3) An aspect of protein metabolism which has been more recently elucidated is the physiological activity of the constituent amino-acids in explaining the stimulating action—the specific dynamic action—of proteins upon the general metabolism and upon heat production.

The evidence of whether guanidin may be a product manifesting a physiological action in the body is worthy of study. The investigations of Kossel and Dakin and the earlier work of Thompson do not negative the probability of the liberation of guanidin from arginin in muscle, while the more recent work of Inouye and of Thompson indicate that guanidin may be split off from arginin. The formation of guanidin, either free or combined, from non-protein sources was demonstrated by Burns to occur in the hen's egg during